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**IN THE DRAWINGS:**

Please substitute the six sheets of replacement drawings: one sheet containing Figures 5A and 6; one sheet containing Figures 7A and 7B; one sheet containing Figures 8A and 8B; one sheet containing Figures 9A-9C; one sheet containing Figures 10A-10C; and one sheet containing Figures 11 and 12, in place of the originally-filed drawing sheets containing the same Figures.

Please also add the four sheets of new drawings: one sheet containing Figures 7C and 7D; one sheet containing Figures 5B and 8C; one sheet containing Figures 9D and 9E; and one sheet containing Figures 10D and 10E.

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**REMARKS**

Claims 1-11, 13, 14, 17 and 18 are pending in the application. All claims stand rejected. Several drawing and specification objections are identified in the Office Action. Each of these will be addressed below. Substantively, claims 1, 2 and 13 stand rejected under 35 U.S.C. §102 as being anticipated by Leon, U.S. Patent No. 2,949,022. Also, claim 17 stands rejected under 35 U.S.C. §103 as being unpatentable over Leon in view of Dodge, U.S. Patent No. 2,322,570.

As an initial matter, Applicant has elected to prosecute the embodiment of Figure 9 and claims 1-11, 13, 14, 17 and 18. The joint shown in Figure 9 is characterized by eight balls, and the second pairs of tracks 24, 25 are designed as shown, for example, in Figure 6 wherein the radius R5 is centered around point O3 and radius R4 is centered about the point OA. The disclosed track configurations provide for improved cage control conditions at larger articulation angles in the joint. In particular, the opening angle  $\alpha$  of the first pairs of tracks 22, 23, at a ball entering the outer joint part beyond the central plane EM, changes steadily until, for articulation angles ranging between 11° and 16°, the opening angle becomes zero. Further articulation results in the opening angle changing to such an extent that it reverses its opening direction, and opens towards the aperture end of the joint. Most of the drawing and specification objections are directed toward a lack of sufficient detail in the drawings to highlight the inventive track configurations.

Accordingly, several drawings have been clarified, and several new views of the same figures have been added. In general, Figures 1-7 and 11 show the same embodiment and thus, the same reference numerals are used to described the various components. In Figure 8, the reference numerals have been indexed by 100. In Figure 9, the reference numerals have been indexed by 200. In Figure 10, the reference numerals have been indexed by 300 and in Figure 12, the reference numerals have been indexed by 400. The specification has been appropriately edited to reflect these reference numeral changes. Thus, the drawing objections set forth in paragraph 3(a) of the Office Action should be overcome.

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With regard to the drawing objections set forth in paragraph 3(b) of the Office Action, claim 1 has been amended to clarify that the track center lines refer to M22, M23, M24, and M25.

With regard to the drawing objections set forth in paragraph 3(c) of the Office Action concerning Figures 7 and 8. New Figures 7C and 7D and 8C have been added showing the track detail for the inner and outer joint parts. In Figure 7, the tracks 24, 25 end in an opposite radius (R4) with respect to the main curve (R5), whereas in Figure 8 tracks 124, 125 end in a straight tangent adjoining the main curve. The specification has been amended at paragraphs [0051] and [0052] to identify the new Figures 7C, 7D, and 8C. No new matter has been added.

With regard to the drawing objections set forth in paragraph 3(d) of the Office Action, specification and drawing changes have been made with respect to Figures 9 and 10 which are similar to those just described with respect to Figures 7 and 8. Thus, in Figure 9, tracks 224, 225 end in an opposite radius (R4) with respect to the main curve (R5), whereas in Figure 10, tracks 324, 325 end in a straight tangent joining the main curve. Figures 9D and 9E and 10D and 10E each show an axial view of the joint, and a section through the first and second pairs of tracks, respectively. Paragraphs [0053] and [0054] of the specification have been amended to identify the new Figures.

With regard to the drawing objections set forth in paragraph 3(e) of the Office Action, Figures 11 and 12 are structurally different. Specifically, the form of track 22 in Figure 11 differs from that of track 422 in Figure 12 and, correspondingly, similar differences exist with respect to the inner tracks. To highlight these differences, the contact point of the first ball at F1 for the same articulation angle of the joint, is indicated by an arrow in both Figures 11 and 12. Because of the structurally different configurations, the joint of Figure 11 has an opening angle  $\alpha$  which reduces and actually changes to open in the opposite direction, whereas the joint of Figure 12 has an opening angle  $\alpha$  which does not change direction.

With respect to the drawing objections set forth in paragraph 3(f) of the Office Action, R1' through R5' as recited in claims 3-11 are shown in Figure 7D. Also, radius R3 is detailed in Figure 5B. No new matter has been added.

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With regard to the drawing objections set forth in paragraph 3(g) of the Office Action, the central ball plane EK is shown in Figure 2, and the travel of the centers of the balls in the ball tracks along the center lines M22, M23, M24, M25 is shown, for example, in Figure 2 as well. Likewise, the opening angle  $\beta$  of the second pairs of tracks 24, 25 is illustrated in Figures 1 and 2. Further, the subject matter of claims 5 and 7-10 are illustrated in Figures 5 and 6 and Figure 7D.

With regard to the specification objections set forth in paragraph 5 of the Office Action, Applicant has corrected the obvious typographical error at page 13, lines 4 and 5 regarding the opening angle  $\alpha$  changing to open towards the aperture end of the joint. Also, the disclosures which are incorporated by reference at paragraph [0045] and [0046] of the specification have been amended to reflect their U.S. Publication Number or U.S. Patent Number. Thus, regardless of whether the material constitutes "essential material" within the meaning of 37 CFR §1.57(c), is properly incorporated into the present specification because it is identified as a U.S. patent or U.S. patent publication.

With regard to the antecedent basis objections concerning the specification at paragraph 7 of the Office Action, a proper antecedent basis has been provided for all of the claims set forth therein. Paragraph [0039] provides a proper antecedent support for claim 2. Paragraphs [0048] and [0051] provide an antecedent basis for the limitations identified with respect to claim 3. Paragraphs [0014], [0049] and [0051] provide antecedent support for all of the limitations of claim 5. Claims 13 and 14 find antecedent support at paragraphs [0017] and [0040] of the specification. Finally, claims 7-10 find antecedent support at paragraphs [0015] and [0050] of the specification.

With regard to the claim rejections under 35 U.S.C. §112, first paragraph, the enablement issue with respect to claim 1 has been corrected by correcting the typographical error at page 13, lines 2-6 of the specification. Similarly, with respect to the rejection of claim 3 and the use of the term "region," a translation error has been corrected which clarifies that all of the various radii claimed adjoin one another. They are not separated by any undefined region. Further, to improve the clarity of several of the claims, the phrase "said arch having" has been inserted before several of the radius recitations in the claims. In view of these changes, the rejections under 35 U.S.C. §112, first paragraph, should be withdrawn.

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With regard to the rejections of claims 1, 2, and 13 under 35 U.S.C. §102 in view of Leon, Applicant traverses the rejections and submits that a *prima facie* case of anticipation has not been established. The Office Action incorrectly asserts that the first set of grooves 21, 23 in Leon will open toward the aperture end of the joint when the joint is articulated such that the ball 26 comes into contact with the beveled surface 27. This is incorrect. The beveled surface 27 does not form any portion of the ball grooves 21, 23. Rather, as is well known from the theory of constant velocity joints, the center lines of the corresponding outer and inner ball grooves in the extended position must be symmetrical with respect to the center plane of the joint in which the balls are held by the ball cage. If this condition is not fulfilled, the balls can be blocked within the pairs of grooves, or lose contact from the pairs of grooves during joint articulation. The beveled surface 27 of Leon only provides clearance to facilitate joint assembly, it does not aid in torque transmission whatsoever. Column 3, lines 28-31 of Leon make this perfectly clear wherein it states "in addition, to facilitate assembly, a bevel surface 27 is provided on the radially outer most edge of each groove 23, 24 in the inner joint member 11. Surfaces 27 provide clearance to facilitate assembly." Because assembly is made possible with the balls passing the beveled surface 27, there is no way to transmit torque at the same angle of articulation by the beveled surface 27. Thus, Leon only identifies apertures 21, 22, 23 and 24 as grooves whereas the beveled surface 27 do not form any part of grooves. In column 3, lines 3-13 of Leon, the configuration of the grooves 21, 22, 23, and 24 are described. No mention is made of the surface 27 as being part of the grooves. Further, if the beveled surface 27 forms a part of the grooves, the description at column 3, lines 3-13 would be inconsistent because it cannot be said that the longitudinal axis of the grooves are straight or that the grooves are inclined in only one direction. Exhibit A attached hereto shows the inability of the inclined surface 27 to transmit torque at significant articulation angles. Thus, the beveled surface 27 only facilitates assembly.

Accordingly, claims 1, 2 and 13 are novel in view of Leon as Leon fails to disclose or suggest at least Applicant's claimed track configurations permitting the opening angle of the joint to decrease and actually change in a directional sense during joint articulation. That is, Leon fails to disclose or suggest a countertrack joint having

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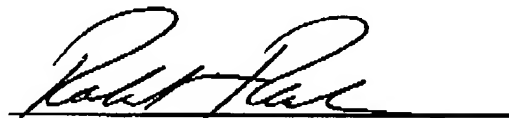
functionally corresponding inner and outer grooves whose center lines are symmetrical with the center plane and which comprise different radii in such a way to permit the opening angle  $\alpha$  which opens in one direction, to decrease through  $0^\circ$  and increase in the opposite sense during joint articulation.

For at least the same reasons set forth with respect to claim 1, claim 17 is novel and non-obvious in view of the combination of Leon and Dodge as these references, either alone or in combination, fail to disclose or suggest each and every limitation of claim 17. Dodge is a VL joint or a cross-groove joint. As Leon and Dodge only disclose joints with straight tracks, it would not have been obvious to one of skill in the art to provide a countertrack joint as claimed wherein pairs of corresponding inner and outer tracks are designed differently such that at least one set of pairs of corresponding inner and outer tracks changes the directional sense of the opening angle as the joint is articulated.

Having overcome all of the objections and rejections set forth in the Office Action, the Applicant respectfully requests that a Notice of Allowance indicating the allowability of claims 1-11, 13, 14, 17 and 18 be issued. The Examiner is invited to telephone the Applicant's undersigned attorney at (248) 223-9500 if any unresolved matters remain. A Petition for Extension of Time (two months) accompanies this paper.

Respectfully submitted,

**ARTZ & ARTZ, P.C.**



Robert P. Rerike, Reg. No. 40,783  
28333 Telegraph Road, Suite 250  
Southfield, MI 48034  
(248) 223-9500

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